

TWO NEW SPECIES OF THE GENUS *LEPANUS* BALTHASAR FROM SOUTH AUSTRALIA (COLEOPTERA: SCARABAEIDAE)

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Ball-rolling dung beetles of the tribe Scarabaeini are recorded for the first time from South Australia. The new species *Lepanus penelopae* and *L. loftyensis* are described from southern Eyre Peninsula and the Mount Lofty Block respectively, and are compared with other species of the genus. There are brief remarks comparing *Lepanus* Balthasar with the related genera *Sauvagesinella* Paulian and *Aptenocanthus* Matthews.

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At the time of the revision by Matthews (1974) of the Australian Scarabaeini, generally known as ball-rolling dung beetles, it was believed that this group was absent from South Australia, although it was known from Victoria and Western Australia. However, in 1979 P. Greenslade obtained specimens of an undescribed species of the genus *Lepanus* Balthasar, which belongs to this tribe, in the Marble Range of southern Eyre Peninsula; and in 1982 another undescribed species of the same genus was collected during extensive pitfall trapping undertaken by J. and P. Greenslade in Kuitpo Kyeema Forest, southern Mount Lofty Ranges, in connection with a project to determine the effects of fire on the forest-floor fauna. Then in 1999 and 2000, more specimens of the second species were picked up by members of the Biological Survey of South Australia in the area of Mount Remarkable at the extreme northern end of the Mount Lofty Block environmental province, as well as near the Barossa Valley, using unbaited pitfall traps. Altogether, the two species are now known from five collection localities (Fig. 1), all situated on low mountain ranges at altitudes from 300 to just over 500 m. Kangaroo Island is part of the Mount Lofty Block but pitfall traps baited with human faeces, set throughout the island by one of the authors (EGM) in November 1990, failed to collect any *Lepanus*.

Lepanus is known from New Guinea, where it was first described, and from densely vegetated mesic and humid habitats along the northern, eastern and southern coasts of Australia as far west as the tangle forest near Walpole, Western

Australia (Matthews 1974). The habitat is leaf litter, and food, where known, consists of vertebrate faecal matter. The descriptions below bring the total number of described Australian species of *Lepanus* to 23, but several undescribed species have been collected in recent years in eastern montane forests (R. Storey, pers. comm.).

Specimens are deposited in the South Australian Museum, Adelaide (SAMA); the Australian National Insect Collection, Canberra (ANIC); the Queensland Museum (QMBM); and the Queensland Department of Primary Industries collection at Mareeba (DPIM).

All figures except the map are by the senior author.

DESCRIPTIONS OF NEW SPECIES

Lepanus penelopae sp. nov.

(Figs 1, 2, 3, 5, 7, 9, 12)

Holotype

'S. Aust. Eyre Pen. Marble Rge. Dense broombush. Pitfall. 4.10.79, P.J.M. Greenslade', male, SAMA.

Paratypes

Same data as holotype, 1 male and 5 females, ANIC, SAMA.

Description

Body uniformly picaceous and nitid, legs rufous. Total length 5.0–6.0 mm. Maximum width across

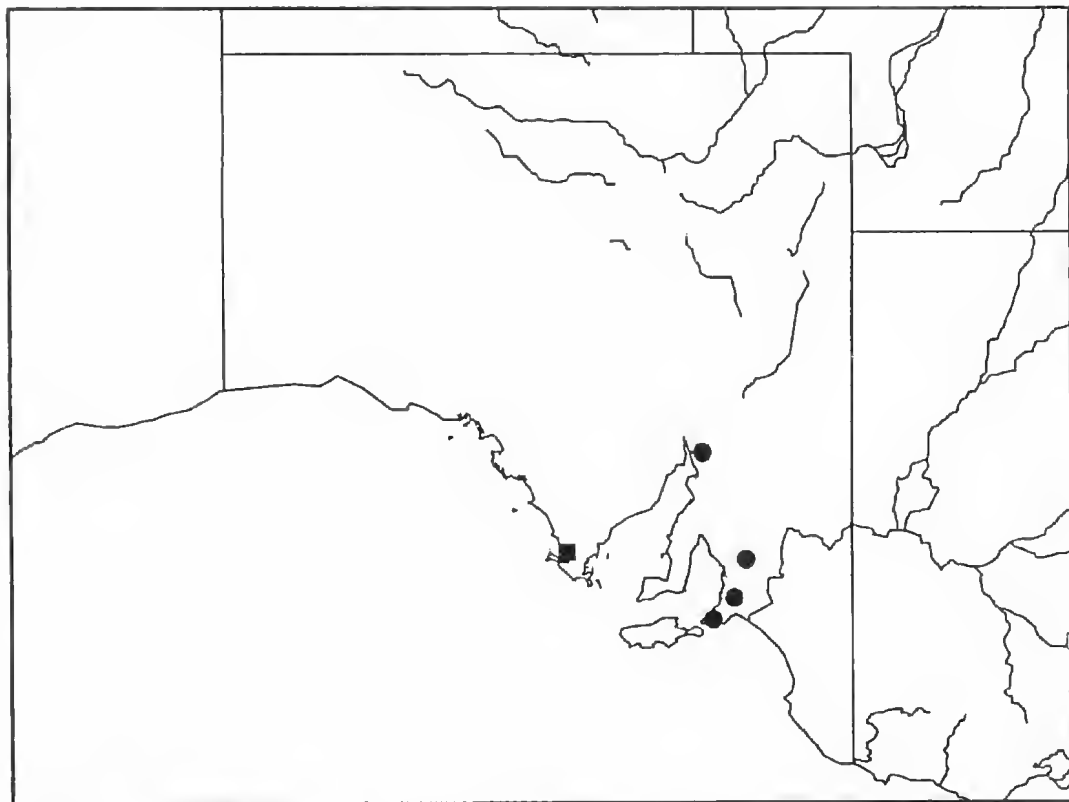


FIGURE 1. Known distribution in South Australia of species of *Lepanus*. ■, *L. penelopae*; ●, *L. loftyensis*.

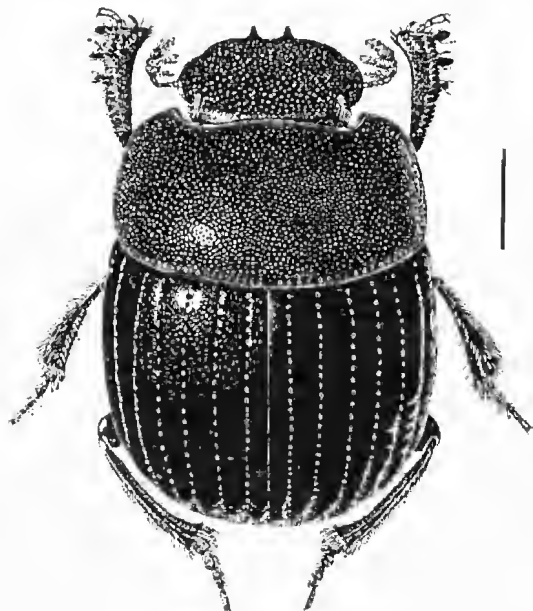
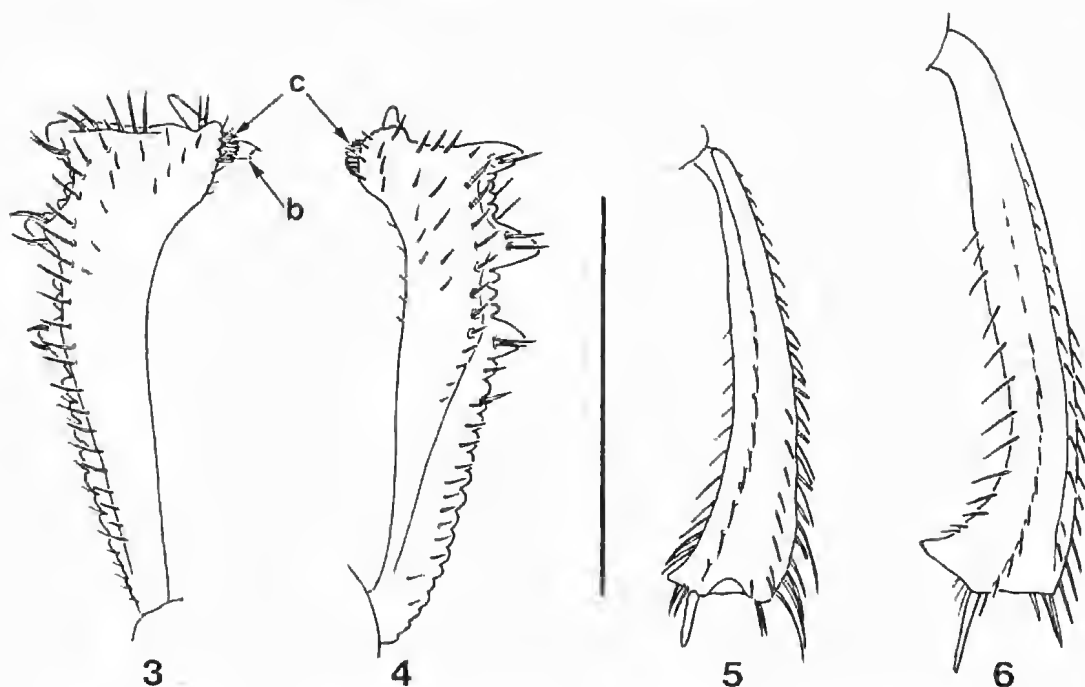


FIGURE 2. *Lepanus penelopae* male, habitus. Scale line 1 mm.

elytra 3.4–3.6 mm. *Head* – Dorsal surface even, very densely punctate with small shallow punctures not running together, some bearing short, very fine recumbent setae. Dorsal part of eye small, its maximum width contained about 25 times in interocular distance. *Prothorax* – Anterior angles subquadrate. Sides of pronotum rounded, widest at broadly rounded posterior angles. Dorsal surface very densely and uniformly finely punctate, punctures separated by distances equal to a little more than their diameter, glabrous. *Elytra* – Striae shallowly impressed with regularly spaced moderately deep punctures separated by 2–4 diameters. Intervals nearly flat, smooth with very slightly uneven surface, glabrous, with minute punctures. *Hind wings* – Absent. *Sterna* – Meso- and metasterna impunctate medially with large shallow cicatricose punctures laterally, glabrous. *Legs* – Protibia with three large teeth on outer edge, which is serrate between teeth and proximal to them. Claws (Fig. 7) a little expanded basally but not distinctly angulate or dentate. *Abdomen* – Pygidium (Fig. 9) with a very deep



FIGURES 3-6. Tibiae of males in dorsal view. 3, *L. penelopae*, left protibia; 4, *L. loftyensis*, right protibia; 5, *L. penelopae*, right metatibia; 6, *L. loftyensis*, right metatibia. b, brush of stiff setae; c, comb of flattened bristles. Scale line 1 mm.

basal groove across whole width of disc, groove narrower and shallower in middle, surface inside it transversely striated. Disc very finely punctate, glabrous. Aedeagus as in Fig. 12. *Sexual dimorphism* – Male with rounded expansion of inner apical end of protibia bearing apical comb of short wide flattened bristles (Fig. 3, c) and on lower surface a brush of long setae which is directed outwardly parallel to surface, extending beyond edge of comb (Fig. 3, b). Metatibia of male (Fig. 5) a little expanded at inner apical edge and bearing small apical tooth there.

Remarks

In the key to the species of *Lepanus* published by Matthews (1974), *L. penelopae* will go to couplet 16 because it has three protibial teeth, and then to couplet 18 because it has a transverse groove on the pygidium and glabrous dorsal surfaces. However, it does not have dentate claws as also required by this couplet. It can then be forced through couplets 19 and 20 to end up with *L. illawarrensis* Matthews of New South Wales, which appears to be the most closely related species, sharing many aspects of structure and secondary sexual characters. *L. penelopae* differs

from *L. illawarrensis* in having simple claws, non-geminate elytral striae with much deeper stria punctures, the pygidial groove more strongly narrowed in the middle, the basal ridge of the pygidium straight in the middle, no trace of a median tubercle on the metasternum of the male, male hind tibia not twisted, and somewhat differently shaped aedeagal parameres.

Etymology

This species is named after Penelope Greenslade, who collected it as well as many of the other specimens of *Lepanus* described in this paper.

Lepanus loftyensis sp. nov.

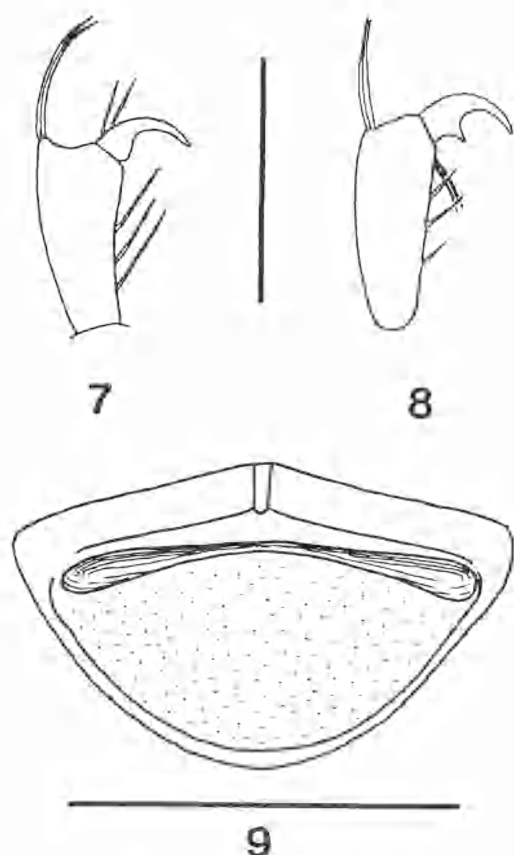
(Figs 1, 4, 6, 8, 10, 11)

Holotype

'S. AUST. Pitfalls Kuitpo Kyeema Forest 15th March, 1982 P. Greenslade', male, SAMA.

Paratypes

Same data as holotype, 12 males, 4 females, ANIC, SAMA. 'S. Aust. Deep Ck Boat Hbr Lane



FIGURES 7-9. 7, *L. penelopae*, claw segment of metatarsus; 8, ditto, *L. loftyensis*. Scale line 0.25 mm; 9, *L. penelopae*, pygidium of male. Scale line 1 mm.

turnoff pitfalls in heath 1-8 Dec 1983 P. Greenslade', 1 female, SAMA. 'S. AUST. Mt Remarkable NP 11 km SSW Wilmington 32°44'56"S 138°04'03"E 20-25 Nov 99 pitfall Flinders Ra. MAM00401', 5 females, ANIC, SAMA. 'S. AUS. 11 km SE Whispering Wall (near Para Wirra) 34°34'54"S 138°55'12"E 27-10-00 SMLR Survey BAR 03201', 17 males, 31 females, SAMA, QMBA, DPIM.

Description

Body uniformly fuscous to piceous, legs rufous. Total length 3.4-5.5 mm, maximum width across elytra 2.3-3.6 mm. *Head* - Surface even, very densely punctate with shallow coarse punctures running together in irregular transverse rows, bearing small recumbent setae. Dorsal part of eye small, slit-like, its maximum width contained about 30 times in interocular distance.

Prothorax - Anterior angles obtuse. Sides of pronotum widest about one-quarter of the distance behind anterior angles, thereafter slightly converging or subparallel to broadly rounded posterior angles. Dorsal surface very densely and uniformly punctate, punctures separated by distances equal to less than their diameter, bearing very fine, short, fully recumbent setae. *Elytra* - Striae very superficial, geminate with slightly crenulate edges, impunctate. Discal intervals flat, in same plane as striae, with more or less undulate surface, finely shagreened, with a row of punctures bearing recumbent setae along edges of each interval, an additional row usually present in middle of intervals near base. *Hind wings* - Atrophied, represented by short stubs. *Sterna* - Mesosternum with shallow punctures on posterior half. Metasternum entirely densely punctate with shallow punctures laterally bearing short, fine recumbent setae. *Legs* - Protibia (Fig. 4) with 3 large teeth on outer edge, which is serrate between teeth and proximal to them. Claws (Fig. 8) strongly dentate. *Abdomen* - Pygidial disc simple, without groove, uniformly densely and shallowly

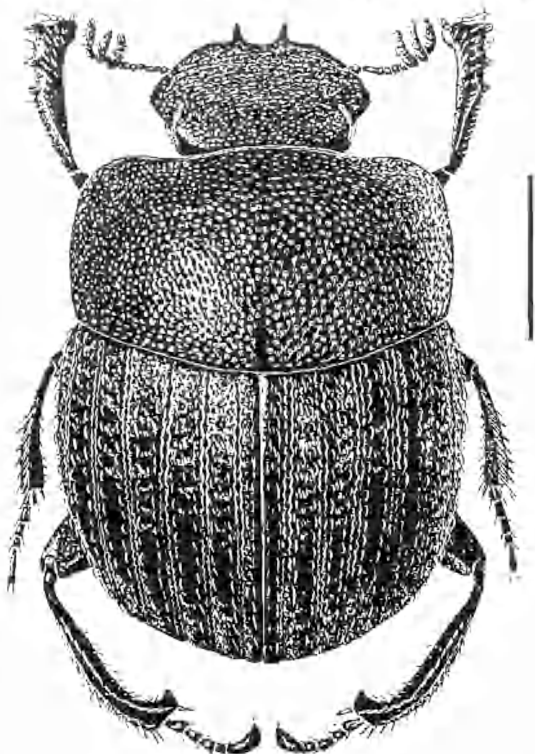


FIGURE 10. *Lepanus loftyensis* male, habitus. Scale line 1 mm.

punctate, punctures bearing very small recumbent setae usually worn off. Aedeagus as in Fig. 11. *Sexual dimorphism* – Male with rounded expansion of inner apical end of protibia bearing apical comb of short, wide, flattened bristles (Fig. 4, c) and a brush of long setae underneath which is directed downward perpendicular to surface. Metatibia of male (Fig. 6) with strongly recurved apical end bearing acute inner tooth. Prothorax of male broader anteriorly, subquadrate; that of female slightly narrower anteriorly. Clypeal teeth of male slightly smaller than those of female.

Remarks

In the key to species of *Lepanus* in Matthews (1974) *L. loftyensis* will first go to couplet 16 because it has three teeth on the outer edge of the protibia, then to couplet 17 because it has a simple pygidium and setose dorsal surfaces, then to *L. villosus* Matthews of north Queensland because of its crenulate elytral striae and densely punctate meso- and metasterna. It differs from *L. villosus* in having superficial elytra striae, reduced hind wings, very different parameres of the aedeagus, and being of much larger size. Further, *L. loftyensis* has the setae on the pronotum only about half the length of those on the elytra, the first elytral interval with a double row of seta-bearing punctures, and the upper edges of the epipleural carina not visible from directly above due to the curvature of the elytra.

The designation MAM 00401 on labels of the Mount Remarkable specimens refers to a locality

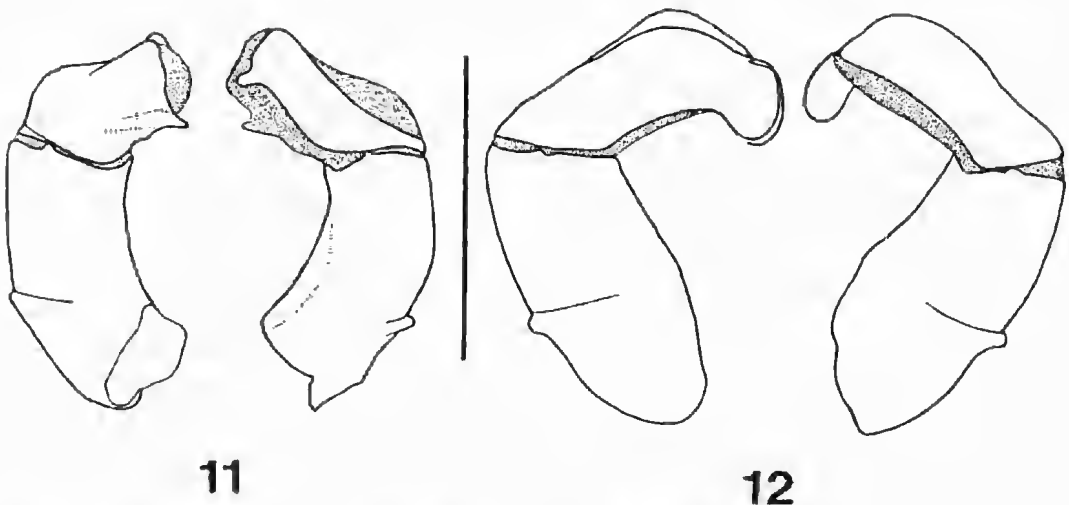
which is described in Brandle (2001) as mountainous, on a hill crest, with loam/sand soil and an overstorey of *Allocasuarina verticillata* at a cover density of 25–50%, and at an altitude above sea level of 430 m. For the Parra Wirra specimens the designation BAR 03201 refers to a ridge top covered with *Eucalyptus fasciculosa* / *Acacia paradoxa* woodland and an understorey of *Calytrix*, *Hakea* and *Xanthorrhoea*, at an altitude of 515 m (L. Qucale, pers. comm.).

Etymology

The name refers to the Mount Lofty Block environmental province in which all four collection localities of this species are contained. The block is Province number 3 as delineated in the Biological Survey of South Australia, and extends from Kangaroo Island northward to Mount Remarkable. The biota of this province is characterised as fully Bassian (Brandle 2001).

DISCUSSION

The existence of the species here described as *Lepanus loftyensis* was briefly noted by Matthews (1984: 6, footnote) erroneously as an undescribed species of *Sauvagesinella* Paulian. *Lepanus* and *Sauvagesinella* are closely related genera which are not separable in the female sex, but in the male there are several secondary sexual characters which will distinguish them. Unlike *Lepanus*, *Sauvagesinella* males have a prominent median



FIGURES 11 & 12. Aedeagi in right and left views. 11, *L. loftyensis*; 12, *L. penelopae*. Scale line 1 mm.

tubercle on the metasternum (only a trace of a tubercle in some *Lepanus*), a row of close-set tubercles along the inner edge of the metatibia, and a more or less compressed metafemur with a longitudinal fold or ridge on its ventral surface. *Sauvagesinella* as understood here does not occur outside the extreme southern part of Western Australia, where there are three species (Matthews 1974).

Storey and Monteith (2000) mention that males of all species of *Aptenocanthon* Matthews, where known, have a similar form of the fore tibial apex with its inner angle expanded and bearing a short brush of stiff setae bent downwards at right angles to the upper tibial surface. This is a similar situation to that found in the two species of *Lepanus* described above (eg Fig. 3, b) and is also known to occur in several other species of *Lepanus* and all three species of *Sauvagesinella*. As well as this brush, there is a comb of flattened bristles at the protibial apex (Figs 3 and 4, c)

which occurs, to varying degrees, in all known males of *Aptenocanthon* and *Sauvagesinella* as well as some species of *Lepanus*. Clearly, these male characters are not limited to *Aptenocanthon* but their value in classification must await further studies on the interrelationships of these genera of Scarabaeini, as also pointed out by Storey and Monteith (2000).

In South Australia the only other known representatives of the dung beetle subfamily Scarabaeinae belong to the tribes Onthophagini (native and introduced *Onthophagus* Latreille), Onitini (introduced *Onitis* Fabricius) and Oniticellini (introduced *Euoniticellus* Janssens), none of which make or roll food balls. All these groups are differentiated from the tribe Scarabaeini by their middle and hind tibiae, which are strongly expanded apically. In Scarabaeini these tibiae are slender and only a little expanded, an adaptation for rolling the food material.

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